SEQUENCE LISTING

<110> President and Fellows of Harvard College , et al.

<120> MODULATION OF IMMUNE SYSTEM FUNCTION BY MODULATION OF POLYPEPTIDE ARGININE METHYLTRANSFERASES

<130> HUI-054PC

<140> 60/531,482
<141> 2003-12-18

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<170> FastSEQ for Windows Version 4.0

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Trp Glu Met Glu Ala Lys Thr Asp Arg Asp Leu Cys Lys Pro Asn Ser
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Ala Gln Val Ser Phe Tyr Val Cys Asn Gly Lys Arg Lys Arg Ser Gln
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<213> Mus musculus

<400> 6

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Met Asp Val Pro Glu Pro Gln Pro Asp Pro Asp Gly Gly Asp Gly Pro
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Gly His Glu Pro Gly Gly Ser Pro Gln Asp Glu Leu Asp Phe Ser Ile
            20                  25                  30
Leu Phe Asp Tyr Asp Tyr Leu Asn Pro Ile Glu Glu Glu Pro Ile Ala
        35                  40                  45
His Lys Ala Ile Ser Ser Pro Ser Gly Leu Ala Tyr Pro Asp Asp Val
    50                  55                  60
```

```
Leu Asp Tyr Gly Leu Lys Pro Cys Asn Pro Leu Ala Ser Leu Ser Gly
65                  70                  75                  80
Glu Pro Pro Gly Arg Phe Gly Glu Pro Asp Ser Ile Gly Phe Gln Asn
                85                  90                  95
Phe Leu Ser Pro Val Lys Pro Ala Gly Ala Ser Gly Pro Ser Pro Arg
            100                 105                 110
Ile Glu Ile Thr Pro Ser His Glu Leu Met Gln Ala Gly Gly Ala Leu
        115                 120                 125
Arg Gly Arg Asp Ala Gly Leu Ser Pro Glu Gln Pro Ala Leu Ala Leu
    130                 135                 140
Ala Gly Val Ala Ala Ser Pro Arg Phe Thr Leu Pro Val Pro Gly Tyr
145                 150                 155                 160
Glu Gly Tyr Arg Glu Pro Leu Cys Leu Ser Pro Ala Ser Ser Gly Ser
                165                 170                 175
Ser Ala Ser Phe Ile Ser Asp Thr Phe Ser Pro Tyr Thr Ser Pro Cys
            180                 185                 190
Val Ser Pro Asn Asn Ala Gly Pro Asp Asp Leu Cys Pro Gln Phe Gln
        195                 200                 205
Asn Ile Pro Ala His Tyr Ser Pro Arg Thr Ser Pro Ile Met Ser Pro
    210                 215                 220
Arg Thr Ser Leu Ala Glu Asp Ser Cys Leu Gly Arg His Ser Pro Val
225                 230                 235                 240
Pro Arg Pro Ala Ser Arg Ser Ser Ser Pro Gly Ala Lys Arg Arg His
                245                 250                 255
Ser Cys Ala Glu Ala Leu Val Ala Pro Leu Pro Ala Ala Ser Pro Gln
            260                 265                 270
Arg Ser Arg Ser Pro Ser Pro Gln Pro Ser Pro His Val Ala Pro Gln
        275                 280                 285
Asp Asp Ser Ile Pro Ala Gly Tyr Pro Pro Thr Ala Gly Ser Ala Val
    290                 295                 300
Leu Met Asp Ala Leu Asn Thr Leu Ala Thr Asp Ser Pro Cys Gly Ile
305                 310                 315                 320
Pro Ser Lys Ile Trp Lys Thr Ser Pro Asp Pro Thr Pro Val Ser Thr
                325                 330                 335
Ala Pro Ser Lys Ala Gly Leu Ala Arg His Ile Tyr Pro Thr Val Glu
            340                 345                 350
Phe Leu Gly Pro Cys Glu Gln Glu Glu Arg Arg Asn Ser Ala Pro Glu
        355                 360                 365
Ser Ile Leu Leu Val Pro Pro Thr Trp Pro Lys Gln Leu Val Pro Ala
    370                 375                 380
Ile Pro Ile Cys Ser Ile Pro Val Thr Ala Ser Leu Pro Pro Leu Glu
385                 390                 395                 400
Trp Pro Leu Ser Asn Gln Ser Gly Ser Tyr Glu Leu Arg Ile Glu Val
                405                 410                 415
Gln Pro Lys Pro His His Arg Ala His Tyr Glu Thr Glu Gly Ser Arg
            420                 425                 430
Gly Ala Val Lys Ala Pro Thr Gly Gly His Pro Val Val Gln Leu His
        435                 440                 445
Gly Tyr Met Glu Asn Lys Pro Leu Gly Leu Gln Ile Phe Ile Gly Thr
    450                 455                 460
Ala Asp Glu Arg Ile Leu Lys Pro His Ala Phe Tyr Gln Val His Arg
465                 470                 475                 480
Ile Thr Gly Lys Thr Val Thr Thr Thr Ser Tyr Glu Lys Ile Val Gly
                485                 490                 495
Asn Thr Lys Val Leu Glu Ile Pro Leu Glu Pro Lys Asn Asn Met Arg
            500                 505                 510
Ala Thr Ile Asp Cys Ala Gly Ile Leu Lys Leu Arg Asn Ala Asp Ile
        515                 520                 525
Glu Leu Arg Lys Gly Glu Thr Asp Ile Gly Arg Lys Asn Thr Arg Val
    530                 535                 540
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Arg Leu Val Phe Arg Val His Val Pro Glu Pro Ser Gly Arg Ile Val
545                 550                 555                 560
Ser Leu Gln Ala Ala Ser Asn Pro Ile Glu Cys Ser Gln Arg Ser Ala
                565                 570                 575
His Glu Leu Pro Met Val Glu Arg Gln Asp Met Asp Ser Cys Leu Val
            580                 585                 590
Tyr Gly Gly Gln Gln Met Ile Leu Thr Gly Gln Asn Phe Thr Ala Glu
        595                 600                 605
Ser Lys Val Val Phe Met Glu Lys Thr Thr Asp Gly Gln Gln Ile Trp
    610                 615                 620
Glu Met Glu Ala Thr Val Asp Lys Asp Lys Ser Gln Pro Asn Met Leu
625                 630                 635                 640
Phe Val Glu Ile Pro Glu Tyr Arg Asn Lys His Ile Arg Val Pro Val
                645                 650                 655
Lys Val Asn Phe Tyr Val Ile Asn Gly Lys Arg Lys Arg Ser Gln Pro
            660                 665                 670
Gln His Phe Thr Tyr His Pro Val Pro Ala Ile Lys Thr Glu Pro Ser
        675                 680                 685
Asp Glu Tyr Glu Pro Ser Leu Ile Cys Ser Pro Ala His Gly Gly Leu
    690                 695                 700
Gly Ser Gln Pro Tyr Tyr Pro Gln His Pro Met Leu Ala Glu Ser Pro
705                 710                 715                 720
Ser Cys Leu Val Ala Thr Met Ala Pro Cys Gln Gln Phe Arg Ser Gly
                725                 730                 735
Leu Ser Ser Pro Asp Ala Arg Tyr Gln Gln Gln Ser Pro Ala Ala Ala
            740                 745                 750
Leu Tyr Gln Arg Ser Lys Ser Leu Ser Pro Gly Leu Leu Gly Tyr Gln
        755                 760                 765
Gln Pro Ser Leu Leu Ala Ala Pro Leu Gly Leu Ala Asp Ala His Arg
    770                 775                 780
Ser Val Leu Val His Ala Gly Ser Gln Gly Gln Gly Gln Gly Ser Thr
785                 790                 795                 800
Leu Arg His Thr Ser Ser Ala Ser Gln Gln Ala Ser Pro Val Ile His
                805                 810                 815
Tyr Ser Pro Thr Asn Gln Gln Leu Arg Gly Gly Gly His Gln Glu Phe
            820                 825                 830
Gln His Ile Met Tyr Cys Glu Asn Phe Gly Pro Ser Ser Ala Arg Pro
        835                 840                 845
Gly Pro Pro Pro Ile Asn Gln Gly Gln Arg Leu Ser Pro Gly Ala Tyr
    850                 855                 860
Pro Thr Val Ile Gln Gln Gln Thr Ala Pro Ser Gln Arg Ala Ala Lys
865                 870                 875                 880
Asn Gly Pro Ser Asp Gln Lys Glu Ala Leu Pro Thr Gly Val Thr Val
                885                 890                 895
Lys Gln Glu Gln Asn Leu Asp Gln Thr Tyr Leu Asp Asp Ala Ala Thr
            900                 905                 910
Ser Glu Ser Trp Val Gly Thr Glu Arg Tyr Ile Glu Arg Lys Phe Trp
        915                 920                 925
Lys Lys Thr Leu Val Gln Pro Gly Leu Leu Pro Ser Phe Leu Leu Leu
    930                 935                 940
Gly Ser Leu Ser Ala Gly Pro Arg Ser Gln Thr Pro Ser Glu Arg Lys
945                 950                 955                 960
Pro Ile Glu Glu Asp Val Pro Leu Ser Cys Ser Gln Ile Ala Trp Cys
                965                 970                 975
Cys Gln His Pro Leu Gly Thr Cys Pro Val Leu Pro Gly Pro Leu Ala
            980                 985                 990
Val Glu Trp Trp Glu Gly Gln Leu Gly Arg Gly Leu Glu Pro Ile Pro
        995                 1000                1005
Trp Ala Pro Asp Ser Ala Gly Ser Leu His Glu Val Asp Ser Val Gly
    1010                1015                1020
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Leu Ala Gly Val Val Gly Met Val Leu Leu Thr Leu Met His His Phe
1025 1030 1035 1040
Ser Met Asp Gln Asn Gln Thr Pro Ser Pro His Trp Gln Arg His Lys
1045 1050 1055
Glu Val Ala Ser Pro Gly Trp Ile
1060

<210> 7
<211> 3638
<212> DNA
<213> Mus musculus

<400> 7
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agatgattgt gcatccattt acatctttaa tgtagatcca cctccatcta ctttaaccac 180
accactttgc ttaccacatc atggattacc gtctcactct tctgttttgt caccatcgtt 240
tcagctccaa agtcacaaaa actatgaagg aacttgtgag attcctgaat ctaaatatag 300
cccattaggt ggtcccaaac cctttgagtg cccaagtatc caatttacat ctatctctcc 360
taactgtcaa caagaattag atgcacatga agatgaccta cagataaatg acccagaacg 420
ggaatttttg gaaaggcctt ctagagatca tctctatctt cctcttgagc catcctaccg 480
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gcagtcaatg ggataccatt gttcaaatgc aggacaaaca gctctttctt ctccagtggc 2700
agaccagatc acaggtcagc cttcttctca tttacagcct attacatatt gtccttcaca 2760
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aagtacaggc caaggaggcc tttctgttcc ttcatcctta gtatgtcaca gtttgtgtga 3000
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<210> 8
<211> 1075
<212> PRT
<213> Mus musculus

<400> 8

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Val Phe Gly Glu Asp Gly Ala Pro Ala Pro Pro Pro Pro Gly Ser Arg
            20                  25                  30
Pro Ala Asp Leu Glu Pro Asp Asp Cys Ala Ser Ile Tyr Ile Phe Asn
        35                  40                  45
Val Asp Pro Pro Pro Ser Thr Leu Thr Thr Pro Leu Cys Leu Pro His
    50                  55                  60
His Gly Leu Pro Ser His Ser Ser Val Leu Ser Pro Ser Phe Gln Leu
65                  70                  75                  80
Gln Ser His Lys Asn Tyr Glu Gly Thr Cys Glu Ile Pro Glu Ser Lys
                85                  90                  95
Tyr Ser Pro Leu Gly Gly Pro Lys Pro Phe Glu Cys Pro Ser Ile Gln
            100                 105                 110
Phe Thr Ser Ile Ser Pro Asn Cys Gln Gln Glu Leu Asp Ala His Glu
        115                 120                 125
Asp Asp Leu Gln Ile Asn Asp Pro Glu Arg Glu Phe Leu Glu Arg Pro
    130                 135                 140
Ser Arg Asp His Leu Tyr Leu Pro Leu Glu Pro Ser Tyr Arg Glu Ser
145                 150                 155                 160
Ser Leu Ser Pro Ser Pro Ala Ser Ser Ile Ser Ser Arg Ser Trp Phe
                165                 170                 175
Ser Asp Ala Ser Ser Cys Glu Ser Leu Ser His Ile Tyr Asp Asp Val
            180                 185                 190
Asp Ser Glu Leu Asn Glu Ala Ala Ala Arg Phe Thr Leu Gly Ser Pro
        195                 200                 205
Leu Thr Ser Pro Gly Gly Ser Pro Gly Gly Cys Pro Gly Glu Glu Ser
    210                 215                 220
Trp His Gln Gln Tyr Gly Ser Gly His Ser Leu Ser Pro Arg Gln Ser
225                 230                 235                 240
Pro Cys His Ser Pro Arg Ser Ser Ile Thr Asp Glu Asn Trp Leu Ser
                245                 250                 255
Pro Arg Pro Ala Ser Gly Pro Ser Ser Arg Pro Thr Ser Pro Cys Gly
            260                 265                 270
Lys Arg Arg His Ser Ser Ala Glu Val Cys Tyr Ala Gly Ser Leu Ser
        275                 280                 285
Pro His His Ser Pro Val Pro Ser Pro Gly His Ser Pro Arg Gly Ser
    290                 295                 300
```

```
Val Thr Glu Asp Thr Trp Leu Thr Ala Pro Val His Thr Gly Ser Gly
305                 310                 315                 320
Leu Ser Pro Ala Pro Phe Pro Phe Gln Tyr Cys Val Glu Thr Asp Ile
                325                 330                 335
Pro Leu Lys Thr Arg Lys Thr Ser Glu Asp Gln Ala Ala Ile Leu Pro
            340                 345                 350
Gly Lys Leu Glu Ile Cys Ser Asp Asp Gln Gly Asn Leu Ser Pro Ser
        355                 360                 365
Arg Glu Thr Ser Val Asp Asp Gly Leu Gly Ser Gln Tyr Pro Leu Lys
    370                 375                 380
Lys Asp Ser Ser Gly Asp Gln Phe Leu Ser Val Pro Ser Pro Phe Thr
385                 390                 395                 400
Trp Ser Lys Pro Lys Pro Gly His Thr Pro Ile Phe Arg Thr Ser Ser
                405                 410                 415
Leu Pro Pro Leu Asp Trp Pro Leu Pro Thr His Phe Gly Gln Cys Glu
            420                 425                 430
Leu Lys Ile Glu Val Gln Pro Lys Thr His His Arg Ala His Tyr Glu
        435                 440                 445
Thr Glu Gly Ser Arg Gly Ala Val Lys Ala Ser Thr Gly Gly His Pro
    450                 455                 460
Val Val Lys Leu Leu Gly Tyr Ser Glu Lys Pro Ile Asn Leu Gln Met
465                 470                 475                 480
Phe Ile Gly Thr Ala Asp Asp Arg Tyr Leu Arg Pro His Ala Phe Tyr
                485                 490                 495
Gln Val His Arg Ile Thr Gly Lys Thr Val Ala Thr Ala Ser Gln Glu
            500                 505                 510
Ile Ile Ile Ala Ser Thr Lys Val Leu Glu Ile Pro Leu Leu Pro Glu
        515                 520                 525
Asn Asn Met Ser Ala Ser Ile Asp Cys Ala Gly Ile Leu Lys Leu Arg
    530                 535                 540
Asn Ser Asp Ile Glu Leu Arg Lys Gly Glu Thr Asp Ile Gly Arg Lys
545                 550                 555                 560
Asn Thr Arg Val Arg Leu Val Phe Arg Val His Ile Pro Gln Pro Ser
                565                 570                 575
Gly Lys Val Leu Ser Leu Gln Ile Ala Ser Ile Pro Val Glu Cys Ser
            580                 585                 590
Gln Arg Ser Ala Gln Glu Leu Pro His Ile Glu Lys Tyr Ser Ile Asn
        595                 600                 605
Ser Cys Ser Val Asn Gly Gly His Glu Met Ile Val Thr Gly Ser Asn
    610                 615                 620
Phe Leu Pro Glu Ser Lys Ile Ile Phe Leu Glu Lys Gly Gln Asp Gly
625                 630                 635                 640
Gly Pro His Trp Glu Val Glu Gly Lys Ile Ile Arg Glu Lys Cys Gln
                645                 650                 655
Gly Ala His Ile Val Leu Glu Val Pro Pro Tyr His Asn Pro Ala Val
            660                 665                 670
Thr Ser Ala Val Gln Val His Phe Tyr Leu Cys Asn Gly Lys Arg Lys
        675                 680                 685
Lys Ser Gln Ser Gln Arg Phe Thr Tyr Thr Pro Val Leu Met Lys Gln
    690                 695                 700
Glu Gln Arg Glu Asp Thr Asp Leu Pro Ser Val Pro Ser Leu Pro Val
705                 710                 715                 720
Pro His Ser Ala Gln Ala Gln Arg Pro Ser Ser Glu Thr Gly His Pro
                725                 730                 735
His Asp Arg Ala Met Ser Ala Pro Gly Gly Leu Leu Cys Gln Val Gln
            740                 745                 750
Pro Ala Tyr Thr Ser Met Val Ala Ser Thr His Leu Pro Gln Leu Gln
        755                 760                 765
Cys Arg Asp Glu Gly Ala Gly Lys Glu Gln His Ile Ala Thr Ser Ser
    770                 775                 780
```

```
Val Met His Gln Pro Phe Gln Val Thr Pro Thr Ser Pro Ile Gly Ser
785                 790                 795                 800
Ser Tyr Gln Ser Ile Gln Thr Ser Met Tyr Asn Gly Pro Thr Cys Leu
                805                 810                 815
Pro Val Asn Pro Ala Ser Ser Gln Glu Phe Asp Pro Val Leu Phe Gln
            820                 825                 830
Gln Asp Ala Ala Leu Ser Ser Leu Val Asn Leu Gly Cys Gln Pro Leu
        835                 840                 845
Ser Pro Ile Pro Phe His Ser Ser Asn Ser Asp Ala Thr Gly His Leu
    850                 855                 860
Leu Ala His Ser Pro His Ser Val Gln Thr Pro Pro His Leu Gln Ser
865                 870                 875                 880
Met Gly Tyr His Cys Ser Asn Ala Gly Gln Thr Ala Leu Ser Ser Pro
                885                 890                 895
Val Ala Asp Gln Ile Thr Gly Gln Pro Ser Ser His Leu Gln Pro Ile
            900                 905                 910
Thr Tyr Cys Pro Ser His Pro Gly Ser Ala Thr Ala Ala Ser Pro Ala
        915                 920                 925
Ala Ser His Pro Leu Ala Ser Ser Pro Ile Ser Gly Pro Ser Ser Pro
    930                 935                 940
Gln Leu Gln Pro Met Pro Tyr Gln Ser Pro Ser Ser Gly Thr Ala Ser
945                 950                 955                 960
Ser Pro Ser Pro Thr Thr Arg Met His Ser Gly Gln His Ser Thr Gln
                965                 970                 975
Ala Gln Ser Thr Gly Gln Gly Gly Leu Ser Val Pro Ser Ser Leu Val
            980                 985                 990
Cys His Ser Leu Cys Asp Pro Ala Ser Phe Pro Pro Gly Gly Ala Thr
        995                 1000                1005
Val Ser Ile Lys Pro Glu Pro Glu Asp Gln Glu Pro Asn Phe Ala Thr
    1010                1015                1020
Ile Gly Leu Gln Asp Ile Thr Leu Asp Asp Val Asn Glu Ile Ile Gly
1025                1030                1035                1040
Arg Asp Met Ser Gln Ile Ser Val Ser Gln Ala Thr Glu Val Met Arg
                1045                1050                1055
Asp Thr Pro Leu Pro Gly Pro Ala Ser Pro Asp Leu Met Thr Ser His
            1060                1065                1070
Ser Ala His
        1075
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<210> 9
<211> 1282
<212> DNA
<213> Mus musculus

<400> 9

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cagaaagtag tgagaagccc aacgctgagg acatgacatc caaagactac tactttgact 180
cctatgccca ctttggcatc cacgaggaga tgctgaagga tgaggtgcgc accctcacat 240
accgcaactc catgtttcac aatcggcatc tcttcaaaga caaggtggtg ctggatgtgg 300
gctcaggcac tggcatcctc tgcatgtttg ctgccaaggc gggggcccgc aaggttattg 360
ggattgagtg ttccagtatc tccgattatg ctgtgaagat tgtcaaagcc aacaagttag 420
accatgtggt gaccatcatc aagggcaagg tggaggaggt ggagctgccc gtggagaagg 480
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ccgtgctgca cgctcgggac aagtggctgg cacccgatgg cctcatcttc ccagaccggg 600
ccaccttgta tgtgacagcc attgaggacc gacaatataa agactacaag atccactggt 660
gggagaacgt gtatggcttt gatatgtcct gcattaaaga cgtggccatc aaggagcccc 720
tggtggacgt ggtggaccca aagcagctgg tcaccaatgc ctgcctcata aaggaggtgg 780
acatttacac agtcaaggtg gaggacctga ccttcacctc ccccttctgc ctgcaagtga 840
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ggctggccct cctgcagaag ggggctcggg gggatgggct tgggggatgg gggggtacat 1200
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cagctgacca tgaaaaaaaa aa 1282

<210> 10
<211> 371
<212> PRT
<213> Mus musculus

<400> 10
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Thr Leu Ala Asn Gly Met Ser Leu Gln Pro Pro Leu Glu Glu Val Ser
20 25 30
Cys Gly Gln Ala Glu Ser Ser Glu Lys Pro Asn Ala Glu Asp Met Thr
35 40 45
Ser Lys Asp Tyr Tyr Phe Asp Ser Tyr Ala His Phe Gly Ile His Glu
50 55 60
Glu Met Leu Lys Asp Glu Val Arg Thr Leu Thr Tyr Arg Asn Ser Met
65 70 75 80
Phe His Asn Arg His Leu Phe Lys Asp Lys Val Val Leu Asp Val Gly
85 90 95
Ser Gly Thr Gly Ile Leu Cys Met Phe Ala Ala Lys Ala Gly Ala Arg
100 105 110
Lys Val Ile Gly Ile Glu Cys Ser Ser Ile Ser Asp Tyr Ala Val Lys
115 120 125
Ile Val Lys Ala Asn Lys Leu Asp His Val Val Thr Ile Ile Lys Gly
130 135 140
Lys Val Glu Glu Val Glu Leu Pro Val Glu Lys Val Asp Ile Ile Ile
145 150 155 160
Ser Glu Trp Met Gly Tyr Cys Leu Phe Tyr Glu Ser Met Leu Asn Thr
165 170 175
Val Leu His Ala Arg Asp Lys Trp Leu Ala Pro Asp Gly Leu Ile Phe
180 185 190
Pro Asp Arg Ala Thr Leu Tyr Val Thr Ala Ile Glu Asp Arg Gln Tyr
195 200 205
Lys Asp Tyr Lys Ile His Trp Trp Glu Asn Val Tyr Gly Phe Asp Met
210 215 220
Ser Cys Ile Lys Asp Val Ala Ile Lys Glu Pro Leu Val Asp Val Val
225 230 235 240
Asp Pro Lys Gln Leu Val Thr Asn Ala Cys Leu Ile Lys Glu Val Asp
245 250 255
Ile Tyr Thr Val Lys Val Glu Asp Leu Thr Phe Thr Ser Pro Phe Cys
260 265 270
Leu Gln Val Lys Arg Asn Asp Tyr Val His Ala Leu Val Ala Tyr Phe
275 280 285
Asn Ile Glu Phe Thr Arg Cys His Lys Arg Thr Gly Phe Ser Thr Ser
290 295 300
Pro Glu Ser Pro Tyr Thr His Trp Lys Gln Thr Val Phe Tyr Met Glu
305 310 315 320
Asp Tyr Leu Thr Val Lys Thr Gly Glu Glu Ile Phe Gly Thr Ile Gly
325 330 335
Met Arg Pro Asn Ala Lys Asn Asn Arg Asp Leu Asp Phe Thr Ile Asp
340 345 350
Leu Asp Phe Lys Gly Gln Leu Cys Glu Leu Ser Cys Ser Thr Asp Tyr
355 360 365

Arg Met Arg
370

<210> 11
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> RNA molecule with two deoxythymidines at 3' end
<400> 11
ccucauucca gauaauucat t 21

<210> 12
<211> 21
<212> DNA
<213> Artificial Sequence
<220>
<223> RNA molecule with two deoxythymidines at 3' end
<400> 12
ugaauuaucu ggaaugaggt t 21

<210> 13
<211> 21
<212> DNA
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<223> RNA molecule with two deoxythymidines at 3' end
<400> 13
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<210> 14
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<212> DNA
<213> Artificial Sequence
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<223> RNA molecule with two deoxythymidines at 3' end
<400> 14
cuuggagacg cuuguucact t 21

<210> 15
<211> 21
<212> DNA
<213> Artificial Sequence
<220>
<223> RNA molecule with two deoxythymidines at 3' end
<400> 15
uccggagauc ucaucgaagt t 21

<210> 16
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ccg atg ccg agt gac gag ggc cgg ggg ccc gga gcg gac caa cag cat   96
Pro Met Pro Ser Asp Glu Gly Arg Gly Pro Gly Ala Asp Gln Gln His
            20                  25                  30

cgt ttc ttc tat ccc gag ccg ggc gca cag gac ccg acc gat cgc cgc  144
Arg Phe Phe Tyr Pro Glu Pro Gly Ala Gln Asp Pro Thr Asp Arg Arg
        35                  40                  45

gca ggt agc agc ctg ggg acg ccc tac tct ggg ggc gcc ctg gtg cct  192
Ala Gly Ser Ser Leu Gly Thr Pro Tyr Ser Gly Gly Ala Leu Val Pro
    50                  55                  60

gcc gcg ccg ggt cgc ttc ctt gga tcc ttc gcc tac ccg ccc cgg gct  240
Ala Ala Pro Gly Arg Phe Leu Gly Ser Phe Ala Tyr Pro Pro Arg Ala
65                  70                  75                  80

cag gtg gct ggc ttt ccc ggg cct ggc gag ttc ttc ccg ccg ccc gcg  288
Gln Val Ala Gly Phe Pro Gly Pro Gly Glu Phe Phe Pro Pro Pro Ala
                85                  90                  95

ggt gcg gag ggc tac ccg ccc gtg gat ggc tac cct gcc cct gac ccg  336
Gly Ala Glu Gly Tyr Pro Pro Val Asp Gly Tyr Pro Ala Pro Asp Pro
            100                 105                 110

cgc gcg ggg ctc tac cca ggg ccg cgc gag gac tac gca ttg ccc gcg  384
Arg Ala Gly Leu Tyr Pro Gly Pro Arg Glu Asp Tyr Ala Leu Pro Ala
        115                 120                 125

ggg ttg gag gtg tct ggg aag ctg aga gtc gcg ctc agc aac cac ctg  432
Gly Leu Glu Val Ser Gly Lys Leu Arg Val Ala Leu Ser Asn His Leu
    130                 135                 140

ttg tgg tcc aag ttc aac cag cac cag aca gag atg atc atc act aag  480
Leu Trp Ser Lys Phe Asn Gln His Gln Thr Glu Met Ile Ile Thr Lys
145                 150                 155                 160

caa gga cgg cga atg ttc cca ttc ctg tcc ttc acc gtg gcc ggg ctg  528
Gln Gly Arg Arg Met Phe Pro Phe Leu Ser Phe Thr Val Ala Gly Leu
                165                 170                 175
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gag ccc aca agc cat tac agg atg ttt gtg gat gtg gtc ttg gtg gac   576
Glu Pro Thr Ser His Tyr Arg Met Phe Val Asp Val Val Leu Val Asp
            180                 185                 190

cag cac cac tgg cgg tac cag agc ggc aag tgg gtg cag tgt gga aag   624
Gln His His Trp Arg Tyr Gln Ser Gly Lys Trp Val Gln Cys Gly Lys
        195                 200                 205

gca gaa ggc agc atg cca ggg aac cgc tta tat gtc cac cca gac tcc   672
Ala Glu Gly Ser Met Pro Gly Asn Arg Leu Tyr Val His Pro Asp Ser
    210                 215                 220

ccc aac acc gga gcc cac tgg atg cgc cag gaa gtt tca ttt ggg aag   720
Pro Asn Thr Gly Ala His Trp Met Arg Gln Glu Val Ser Phe Gly Lys
225                 230                 235                 240

cta aag ctc acc aac aac aag ggg gct tcc aac aat gtg acc cag atg   768
Leu Lys Leu Thr Asn Asn Lys Gly Ala Ser Asn Asn Val Thr Gln Met
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atc gtc ctg cag tct ctc cac aag tac cag ccc cgg ctg cac atc gtg   816
Ile Val Leu Gln Ser Leu His Lys Tyr Gln Pro Arg Leu His Ile Val
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gag gtg aat gat gga gag cca gag gct gcc tgc agt gct tct aac aca   864
Glu Val Asn Asp Gly Glu Pro Glu Ala Ala Cys Ser Ala Ser Asn Thr
        275                 280                 285

cac gtc ttt act ttc caa gag acc cag ttc att gca gtg act gcc tac   912
His Val Phe Thr Phe Gln Glu Thr Gln Phe Ile Ala Val Thr Ala Tyr
    290                 295                 300

cag aac gca gag atc act cag ctg aaa atc gac aac aac ccc ttt gcc   960
Gln Asn Ala Glu Ile Thr Gln Leu Lys Ile Asp Asn Asn Pro Phe Ala
305                 310                 315                 320

aaa gga ttc cgg gag aac ttt gag tcc atg tac gca tct gtt gat acg   1008
Lys Gly Phe Arg Glu Asn Phe Glu Ser Met Tyr Ala Ser Val Asp Thr
                325                 330                 335

agt gtc ccc tcg cca cct gga ccc aac tgt caa ctg ctt ggg gga gac   1056
Ser Val Pro Ser Pro Pro Gly Pro Asn Cys Gln Leu Leu Gly Gly Asp
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ccc ttc tca cct ctt cta tcc aac cag tat cct gtt ccc agc cgt ttc   1104
Pro Phe Ser Pro Leu Leu Ser Asn Gln Tyr Pro Val Pro Ser Arg Phe
        355                 360                 365

tac ccc gac ctt cca ggc cag ccc aag gat atg atc tca cag cct tac   1152
Tyr Pro Asp Leu Pro Gly Gln Pro Lys Asp Met Ile Ser Gln Pro Tyr
    370                 375                 380

tgg ctg ggg aca cct cgg gaa cac agt tat gaa gcg gag ttc cga gct   1200
Trp Leu Gly Thr Pro Arg Glu His Ser Tyr Glu Ala Glu Phe Arg Ala
385                 390                 395                 400

gtg agc atg aag ccc aca ctc cta ccc tct gcc ccg ggg ccc act gtg   1248
Val Ser Met Lys Pro Thr Leu Leu Pro Ser Ala Pro Gly Pro Thr Val
                405                 410                 415
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ccc tac tac cgg ggc caa gac gtc ctg gcg cct gga gct ggt tgg ccc   1296
Pro Tyr Tyr Arg Gly Gln Asp Val Leu Ala Pro Gly Ala Gly Trp Pro
            420                 425                 430

gtg gcc cct caa tac ccg ccc aag atg agc cca gct ggc tgg ttc cgg   1344
Val Ala Pro Gln Tyr Pro Pro Lys Met Ser Pro Ala Gly Trp Phe Arg
        435                 440                 445

ccc atg cga act ctg ccc atg gac ccg ggc ctg gga tcc tca gag gaa   1392
Pro Met Arg Thr Leu Pro Met Asp Pro Gly Leu Gly Ser Ser Glu Glu
    450                 455                 460

cag ggc tcc tcc ccc tcg ctg tgg cct gag gtc acc tcc ctc cag ccg   1440
Gln Gly Ser Ser Pro Ser Leu Trp Pro Glu Val Thr Ser Leu Gln Pro
465                 470                 475                 480

gag ccc agc gac tca gga cta ggc gaa gga gac act aag agg agg agg   1488
Glu Pro Ser Asp Ser Gly Leu Gly Glu Gly Asp Thr Lys Arg Arg Arg
                485                 490                 495

ata tcc ccc tat cct tcc agt ggc gac agc tcc tct ccc gct ggg gcc   1536
Ile Ser Pro Tyr Pro Ser Ser Gly Asp Ser Ser Ser Pro Ala Gly Ala
            500                 505                 510

cct tct cct ttt gat aag gaa acc gaa ggc cag ttt tat aat tat ttt   1584
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Pro Asn
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            20                  25                  30

Arg Phe Phe Tyr Pro Glu Pro Gly Ala Gln Asp Pro Thr Asp Arg Arg
        35                  40                  45

Ala Gly Ser Ser Leu Gly Thr Pro Tyr Ser Gly Gly Ala Leu Val Pro
    50                  55                  60

Ala Ala Pro Gly Arg Phe Leu Gly Ser Phe Ala Tyr Pro Pro Arg Ala
65                  70                  75                  80

Gln Val Ala Gly Phe Pro Gly Pro Gly Glu Phe Phe Pro Pro Pro Ala
                85                  90                  95

Gly Ala Glu Gly Tyr Pro Pro Val Asp Gly Tyr Pro Ala Pro Asp Pro
            100                 105                 110
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Arg Ala Gly Leu Tyr Pro Gly Pro Arg Glu Asp Tyr Ala Leu Pro Ala
        115                 120                 125

Gly Leu Glu Val Ser Gly Lys Leu Arg Val Ala Leu Ser Asn His Leu
    130                 135                 140

Leu Trp Ser Lys Phe Asn Gln His Gln Thr Glu Met Ile Ile Thr Lys
145                 150                 155                 160

Gln Gly Arg Arg Met Phe Pro Phe Leu Ser Phe Thr Val Ala Gly Leu
                165                 170                 175

Glu Pro Thr Ser His Tyr Arg Met Phe Val Asp Val Val Leu Val Asp
            180                 185                 190

Gln His His Trp Arg Tyr Gln Ser Gly Lys Trp Val Gln Cys Gly Lys
        195                 200                 205

Ala Glu Gly Ser Met Pro Gly Asn Arg Leu Tyr Val His Pro Asp Ser
    210                 215                 220

Pro Asn Thr Gly Ala His Trp Met Arg Gln Glu Val Ser Phe Gly Lys
225                 230                 235                 240

Leu Lys Leu Thr Asn Asn Lys Gly Ala Ser Asn Asn Val Thr Gln Met
                245                 250                 255

Ile Val Leu Gln Ser Leu His Lys Tyr Gln Pro Arg Leu His Ile Val
            260                 265                 270

Glu Val Asn Asp Gly Glu Pro Glu Ala Ala Cys Ser Ala Ser Asn Thr
        275                 280                 285

His Val Phe Thr Phe Gln Glu Thr Gln Phe Ile Ala Val Thr Ala Tyr
    290                 295                 300

Gln Asn Ala Glu Ile Thr Gln Leu Lys Ile Asp Asn Asn Pro Phe Ala
305                 310                 315                 320

Lys Gly Phe Arg Glu Asn Phe Glu Ser Met Tyr Ala Ser Val Asp Thr
                325                 330                 335

Ser Val Pro Ser Pro Pro Gly Pro Asn Cys Gln Leu Leu Gly Gly Asp
            340                 345                 350

Pro Phe Ser Pro Leu Leu Ser Asn Gln Tyr Pro Val Pro Ser Arg Phe
        355                 360                 365

Tyr Pro Asp Leu Pro Gly Gln Pro Lys Asp Met Ile Ser Gln Pro Tyr
    370                 375                 380

Trp Leu Gly Thr Pro Arg Glu His Ser Tyr Glu Ala Glu Phe Arg Ala
385                 390                 395                 400

Val Ser Met Lys Pro Thr Leu Leu Pro Ser Ala Pro Gly Pro Thr Val
                405                 410                 415

Pro Tyr Tyr Arg Gly Gln Asp Val Leu Ala Pro Gly Ala Gly Trp Pro
            420                 425                 430
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Val Ala Pro Gln Tyr Pro Pro Lys Met Ser Pro Ala Gly Trp Phe Arg
        435                 440                 445

Pro Met Arg Thr Leu Pro Met Asp Pro Gly Leu Gly Ser Ser Glu Glu
    450                 455                 460

Gln Gly Ser Ser Pro Ser Leu Trp Pro Glu Val Thr Ser Leu Gln Pro
465                 470                 475                 480

Glu Pro Ser Asp Ser Gly Leu Gly Glu Gly Asp Thr Lys Arg Arg Arg
                485                 490                 495

Ile Ser Pro Tyr Pro Ser Ser Gly Asp Ser Ser Ser Pro Ala Gly Ala
            500                 505                 510

Pro Ser Pro Phe Asp Lys Glu Thr Glu Gly Gln Phe Tyr Asn Tyr Phe
        515                 520                 525

Pro Asn
    530
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